

The diagram illustrates a laser beam control system for an optical disc. The system is divided into two main sections: a mechanical assembly on the left and a control system on the right.

**Mechanical Assembly (Left):**

- 1 optical disc:** A horizontal disc with a central hole.
- 13 screw:** A vertical screw passing through the center of the disc.
- 14 laser:** A laser source mounted on the screw.
- 15 objective lens:** A lens mounted on the laser.
- 16 optical detector:** A detector mounted on the laser.
- 18 voice coil:** A voice coil mounted on the laser.
- 2 motor:** A motor mounted on the screw.
- 3 feed motor:** A feed motor mounted on the screw.
- 4 optical pick-up:** A component that receives signals from the optical detector and the feed motor.

**Control System (Right):**

- operation control system:** The central control unit, which receives input from the optical pick-up and outputs control signals to various components.
- 6 BCA signal generator:** Generates a BCA signal that is sent to the operation control system.
- 7 waveform setter:** Receives signals from the operation control system and the BCA signal generator, and outputs a signal to the laser power controller.
- 5 laser power controller:** Receives signals from the operation control system and the waveform setter, and outputs a signal to the laser.
- 8 focus controller:** Receives signals from the operation control system and the laser power controller, and outputs a signal to the preamplifier.
- 17 preamplifier:** Receives signals from the operation control system and the focus controller, and outputs a signal to the position detector.
- 11 position detector:** Receives signals from the operation control system and the preamplifier, and outputs a signal to the feed motor controller.
- 10 feed motor controller:** Receives signals from the operation control system and the position detector, and outputs a signal to the feed motor.
- rotation controller:** Receives signals from the operation control system and the feed motor controller, and outputs a signal to the rotation controller.

**Legend:**

- 9 feed motor
- 13 screw
- 14 laser
- 15 objective lens
- 16 optical detector
- 18 voice coil

FIG. 2

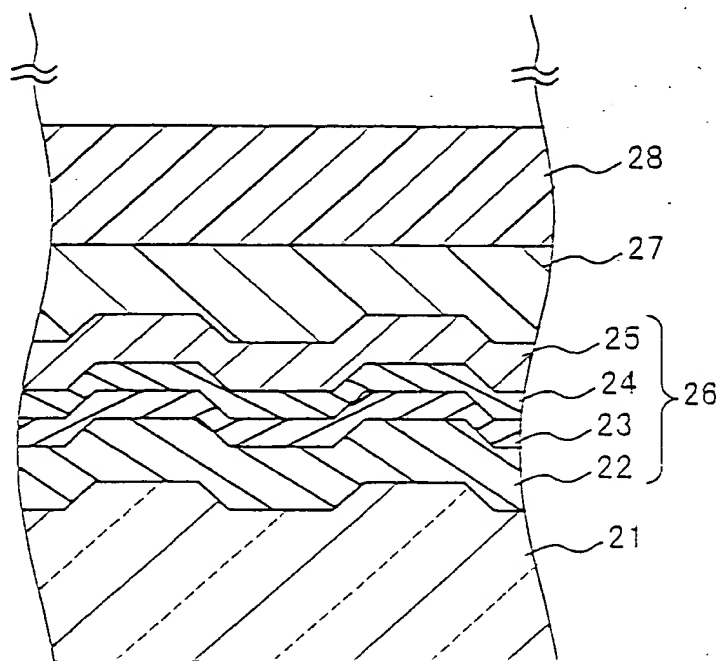
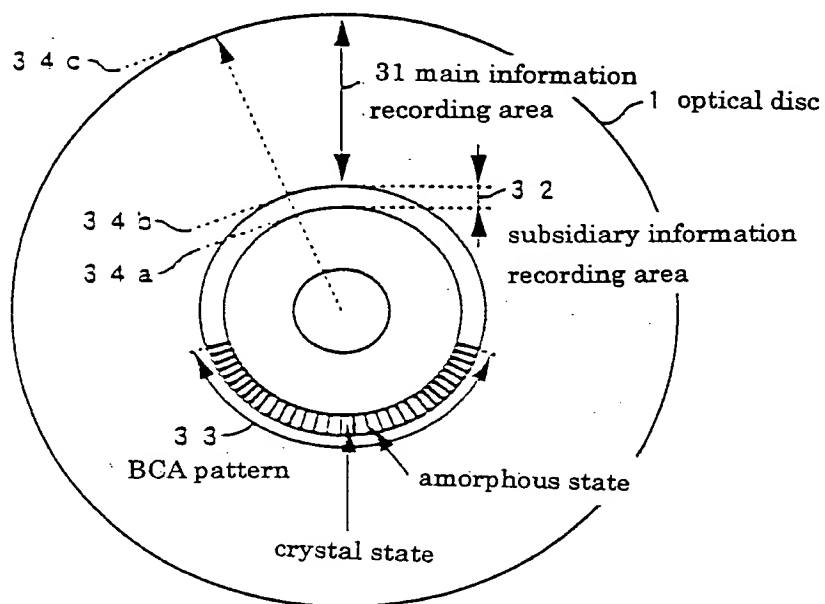


FIG. 3



09/786877-031201

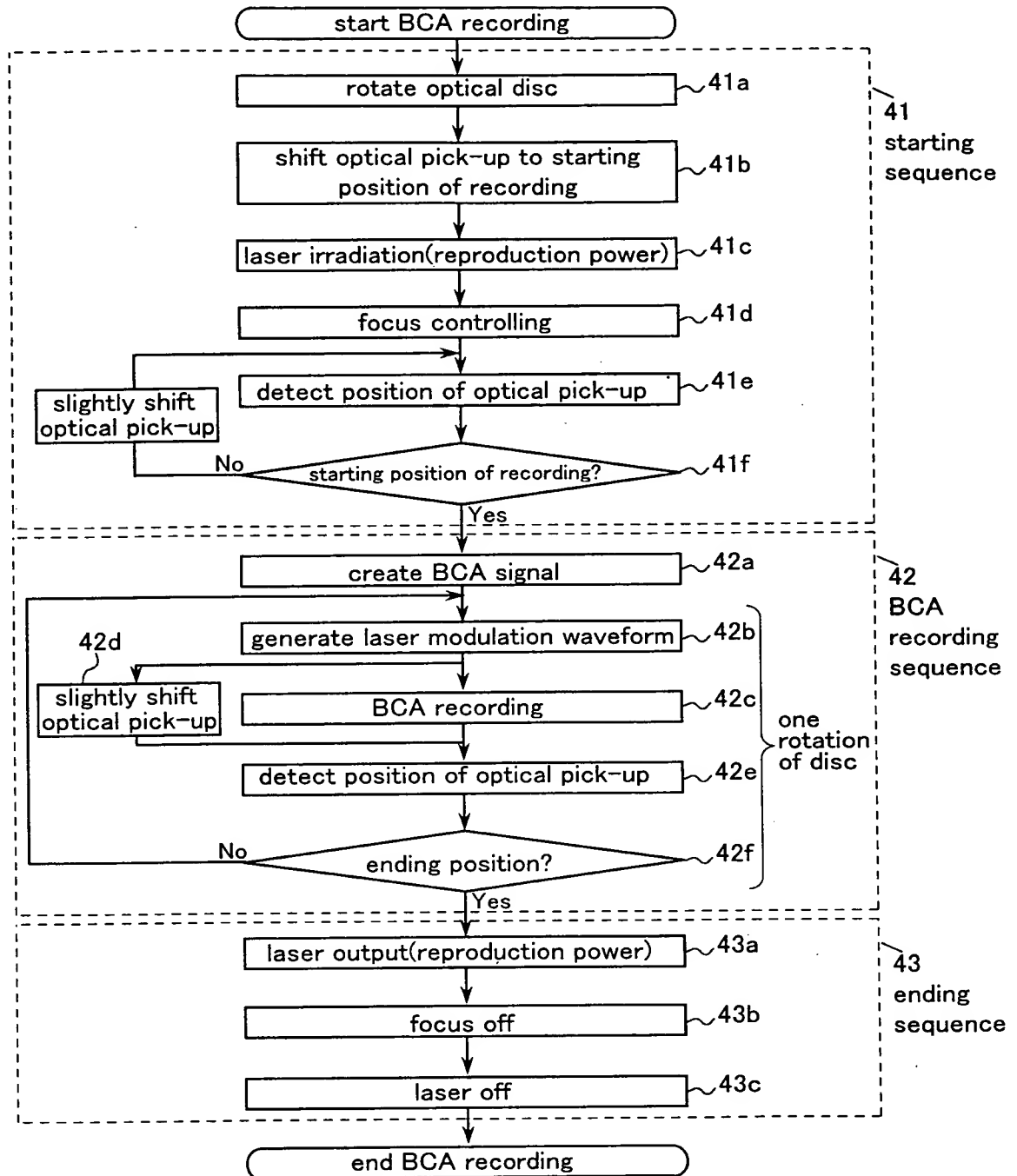


FIG. 4

FIG. 5

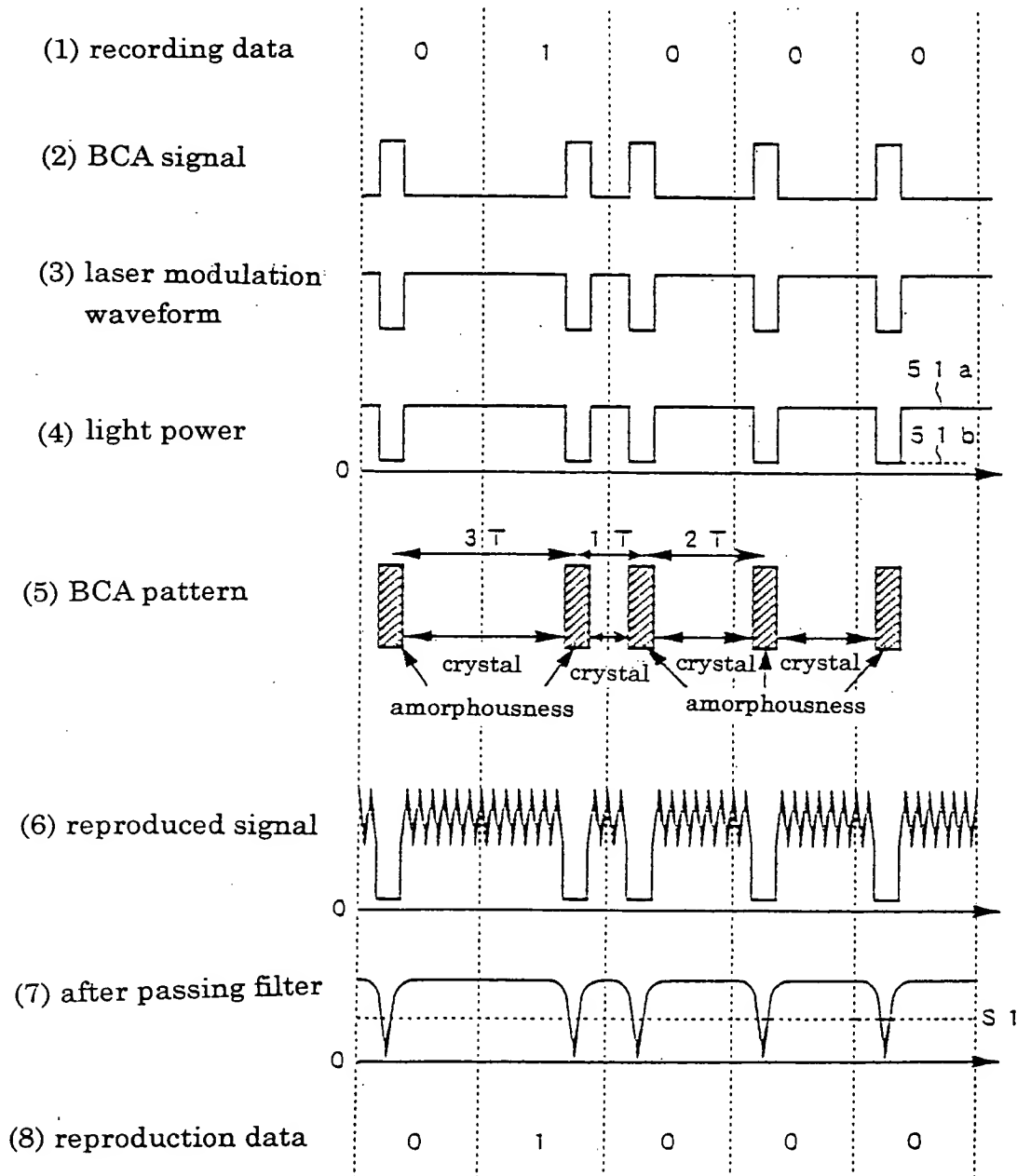
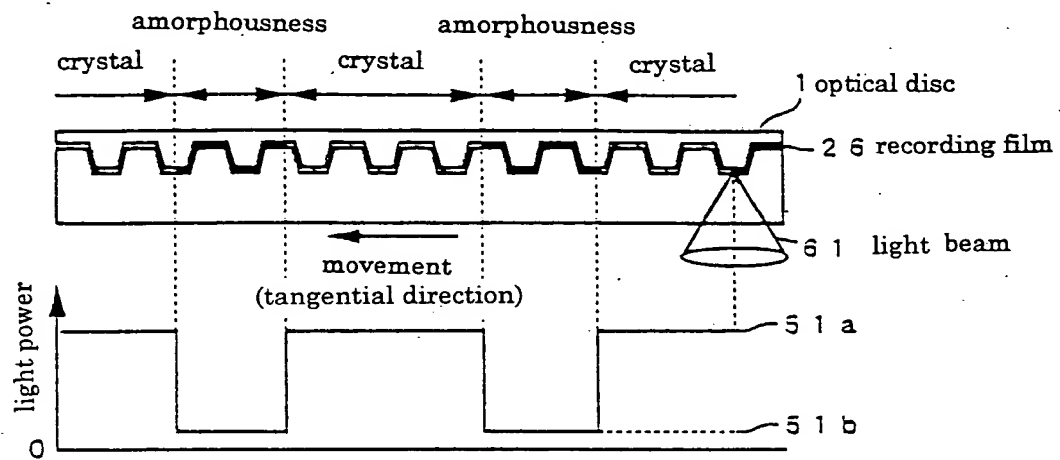
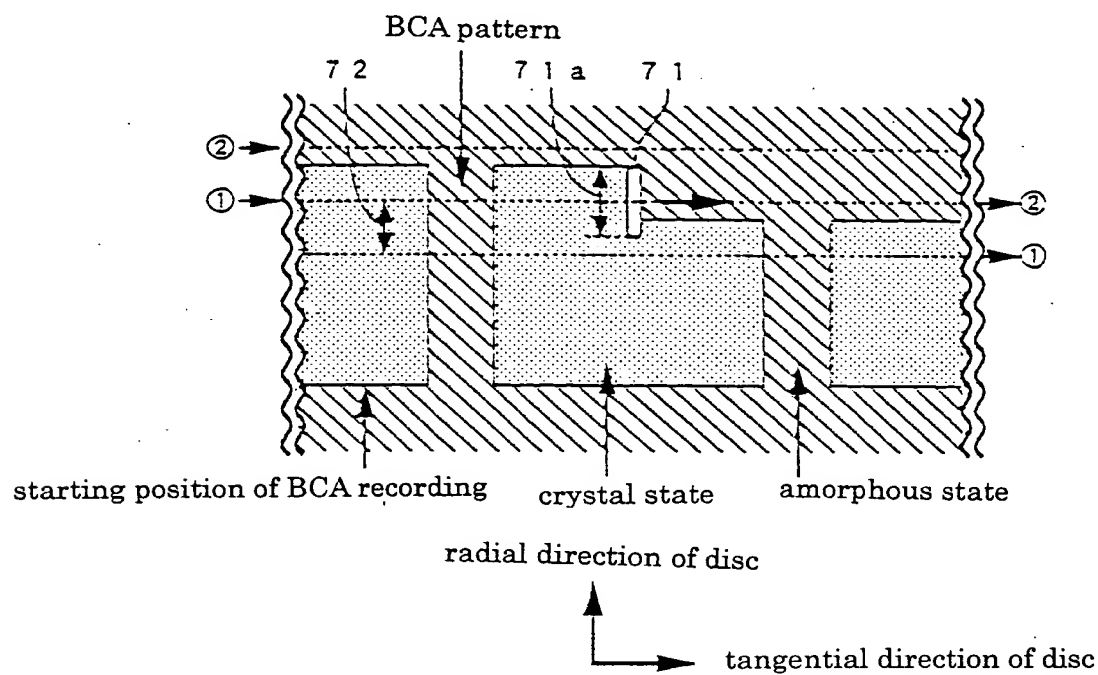


FIG. 6



09/786877-031201

FIG. 7

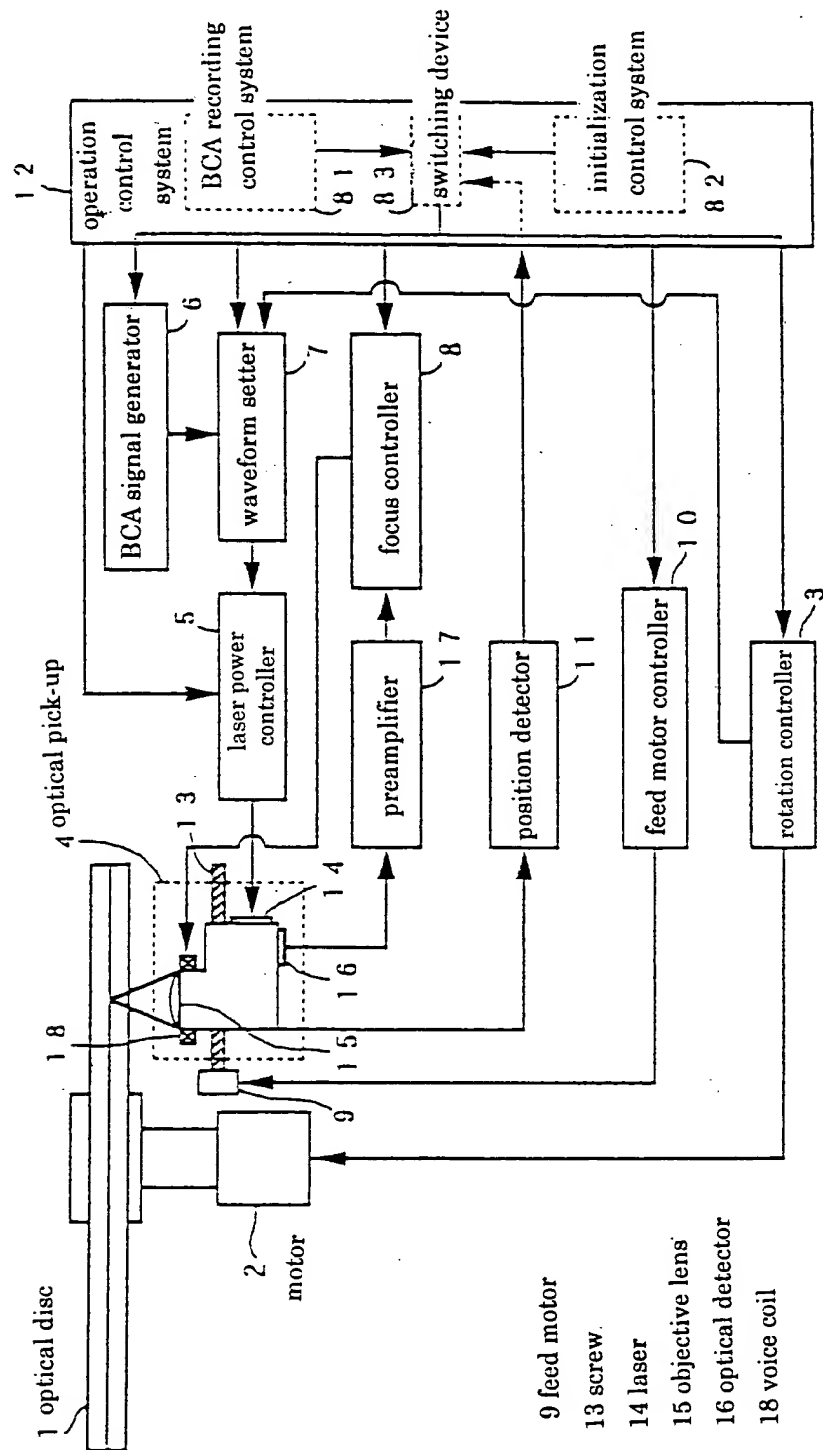


71 focus spot

71a length of focus spot in radial direction

72 moving amount of optical pick-up (per one cycle of disc)

FIG. 8





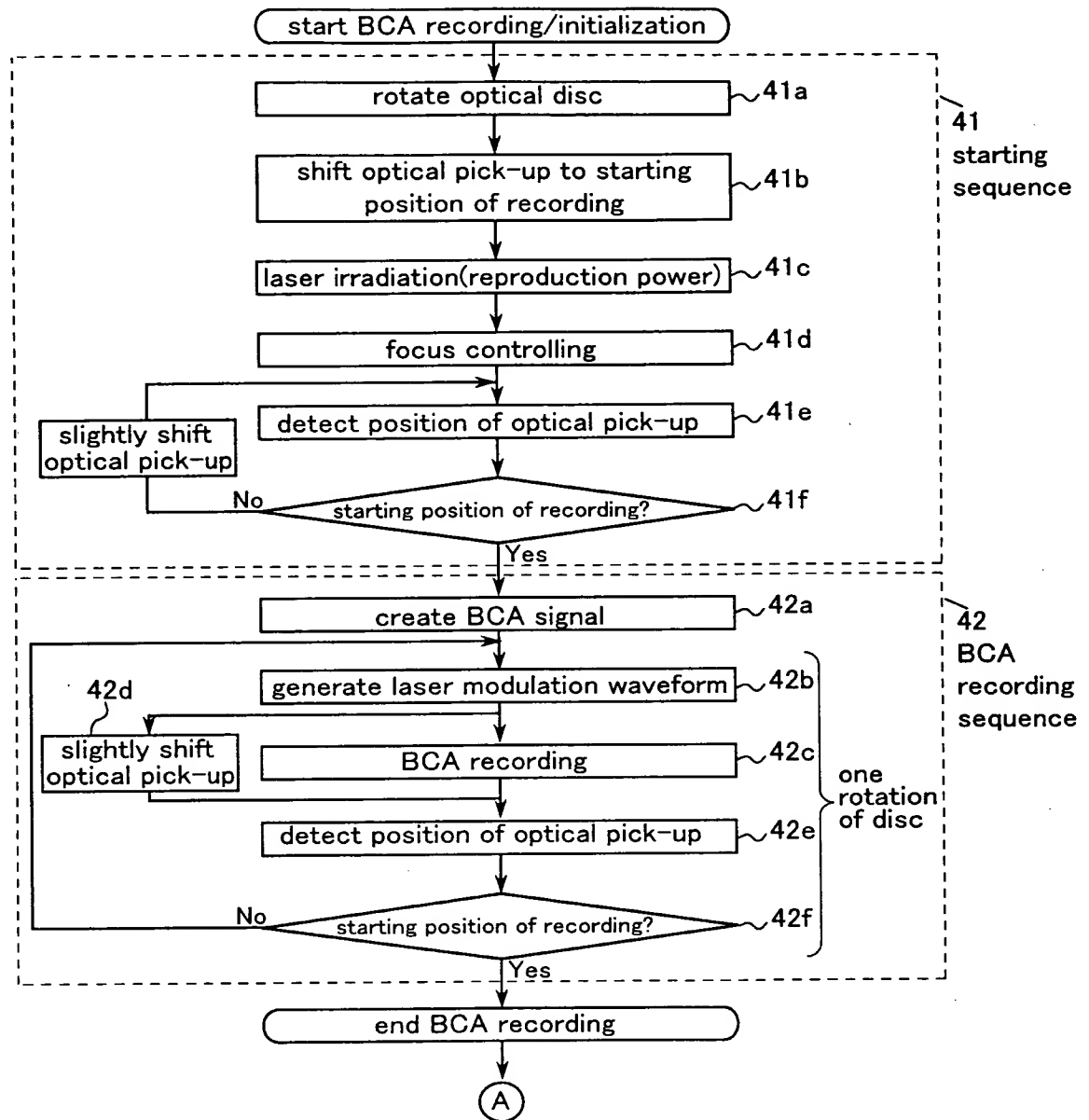


FIG. 9

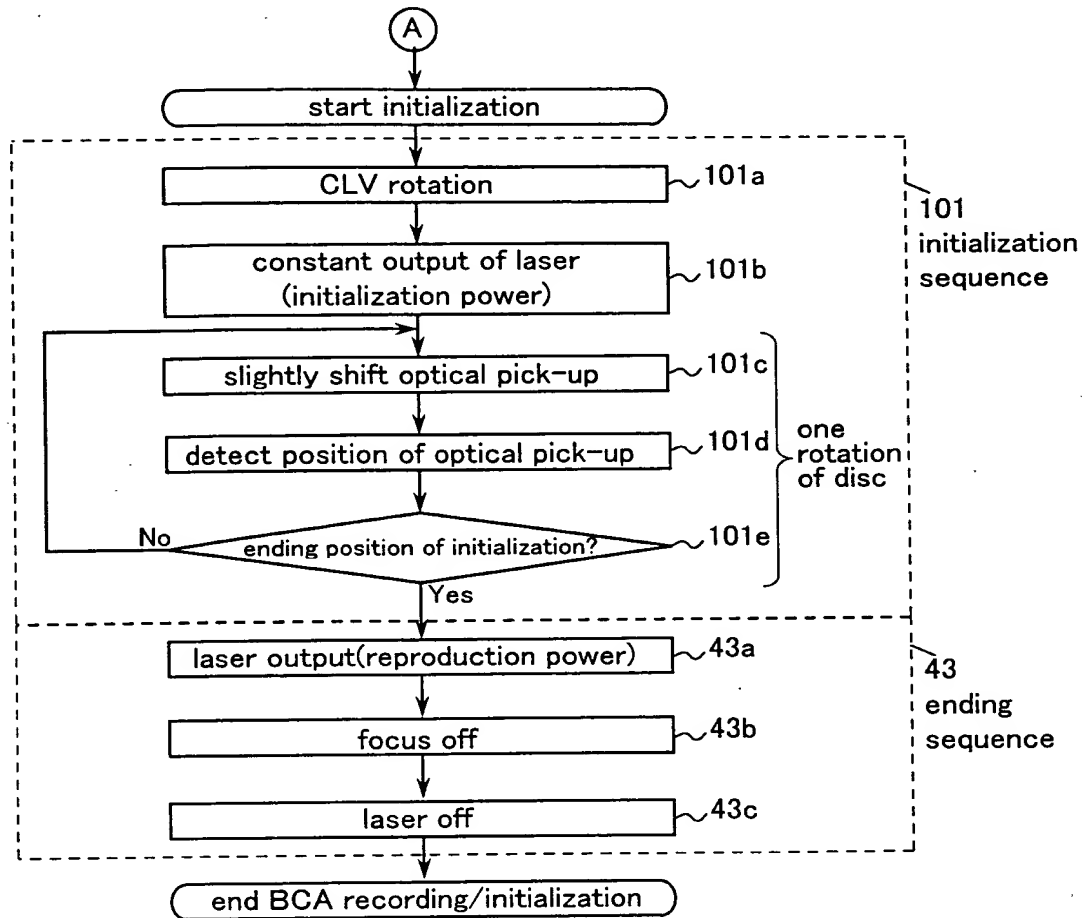
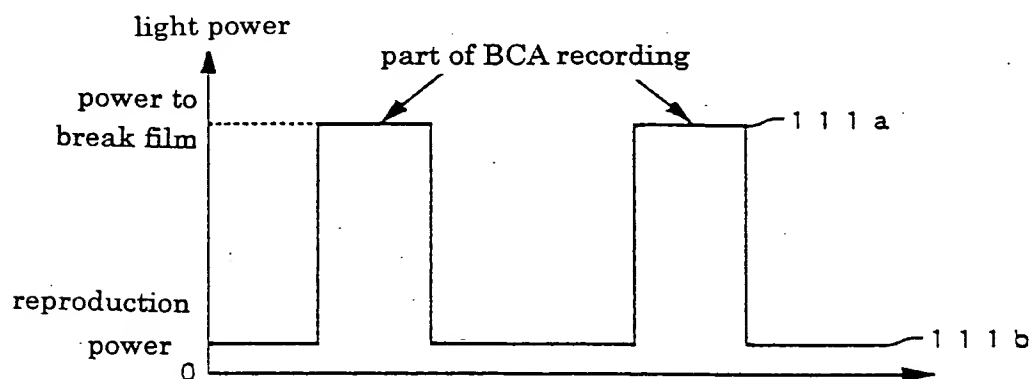


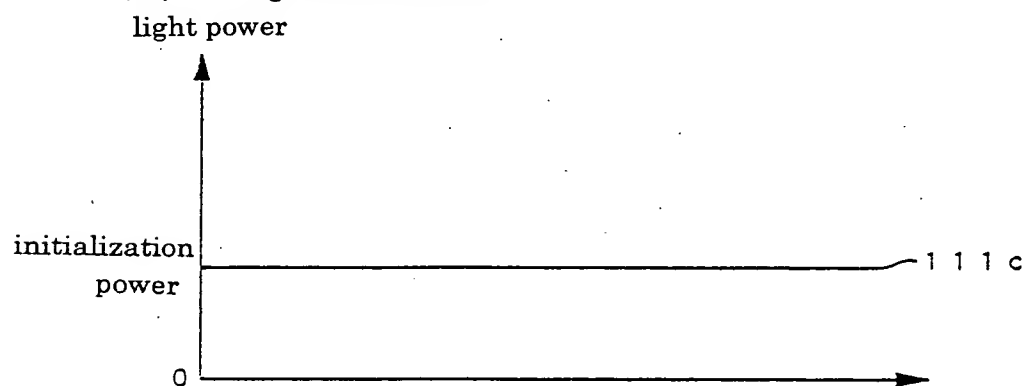
FIG. 10

FIG. 11

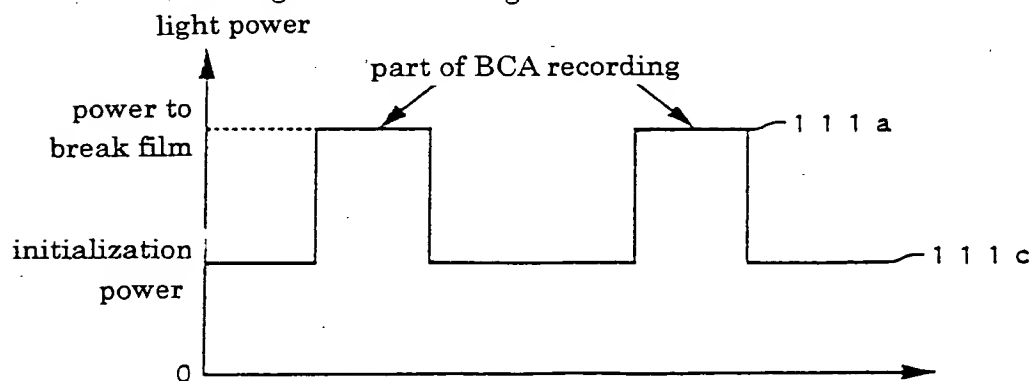
(1) during BCA recording 1



(2) during initialization



(3) during BCA recording 2



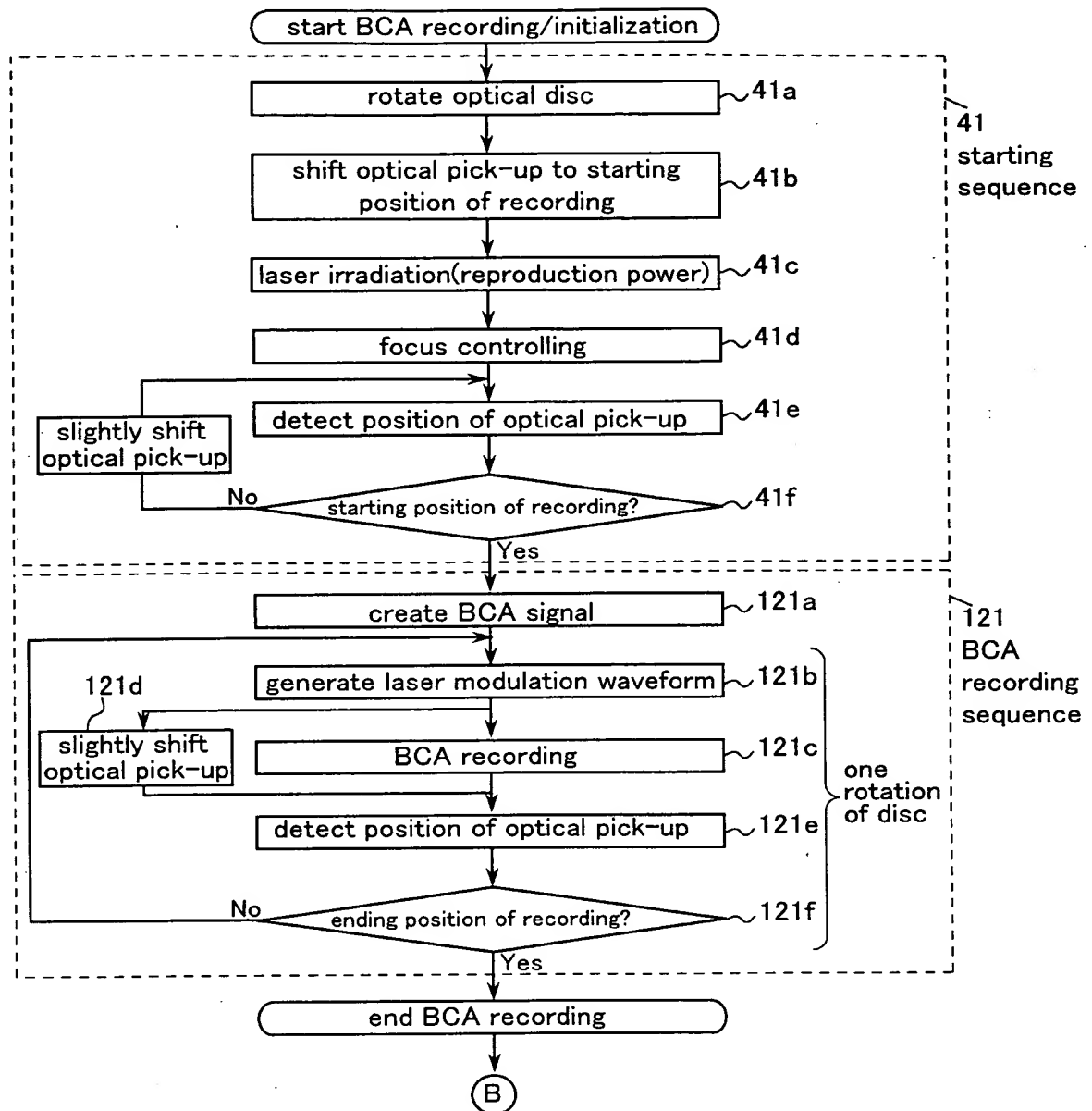


FIG. 12

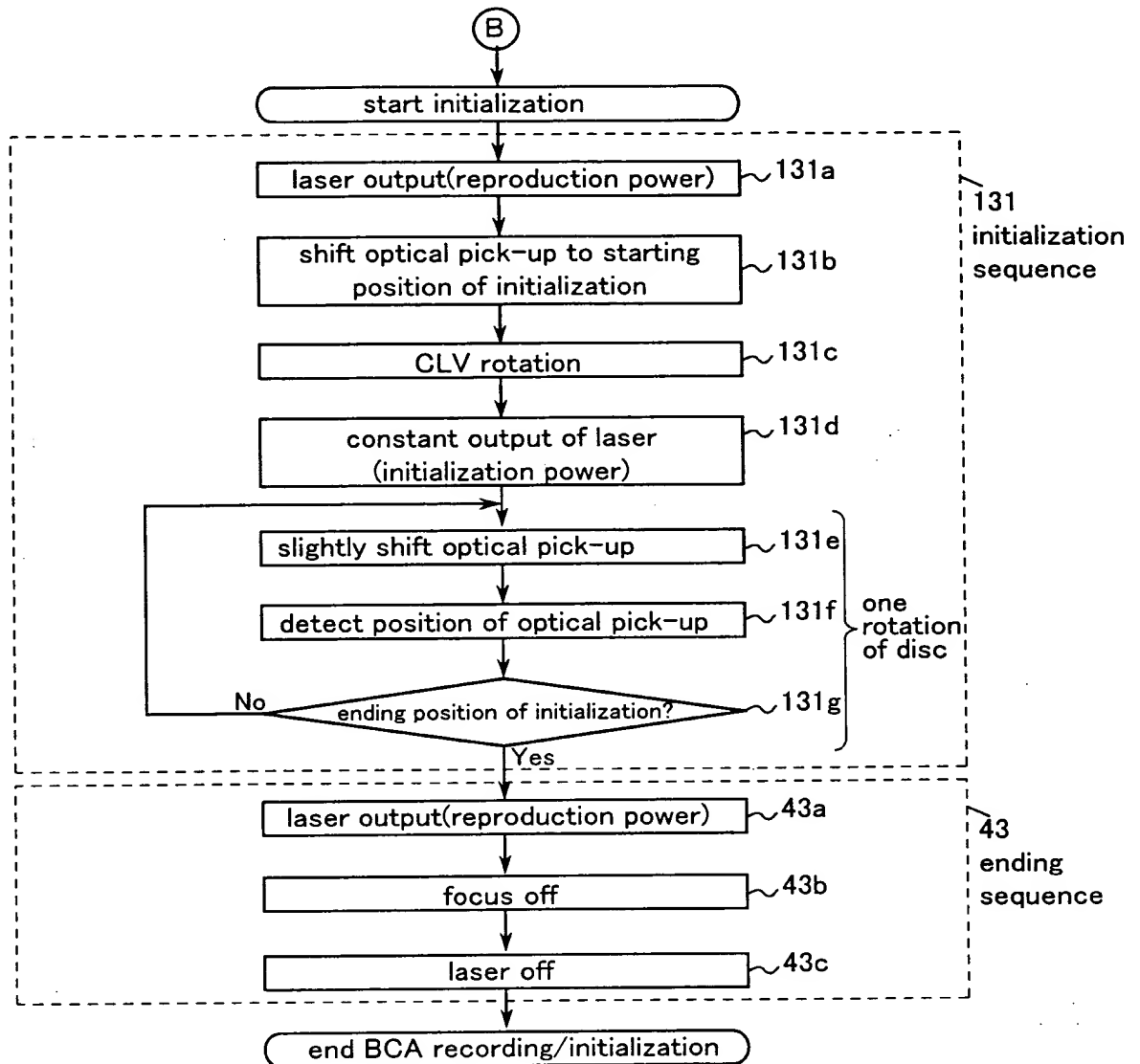


FIG. 13

FIG. 14

(1) BCA recording by laser

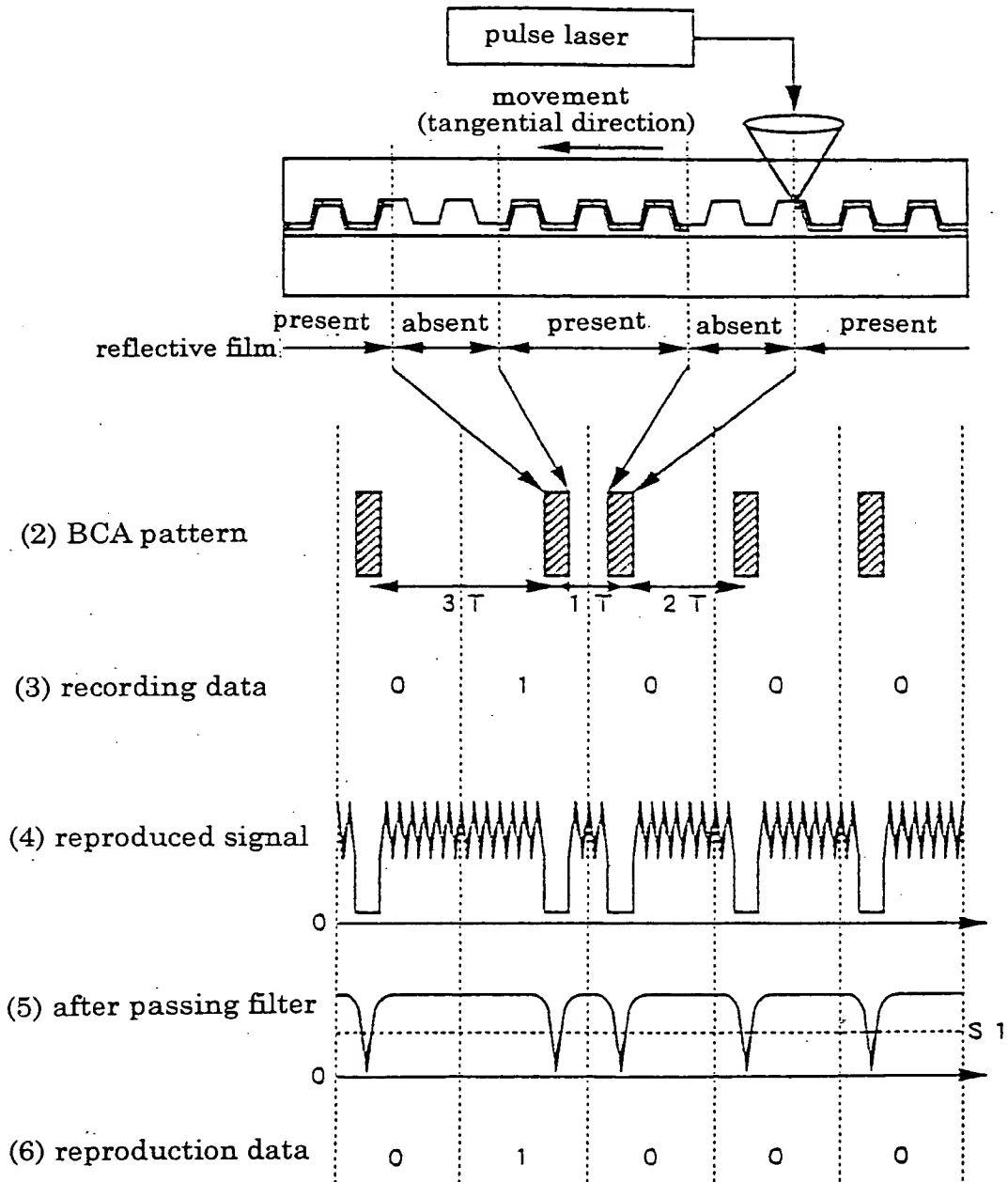


FIG. 15

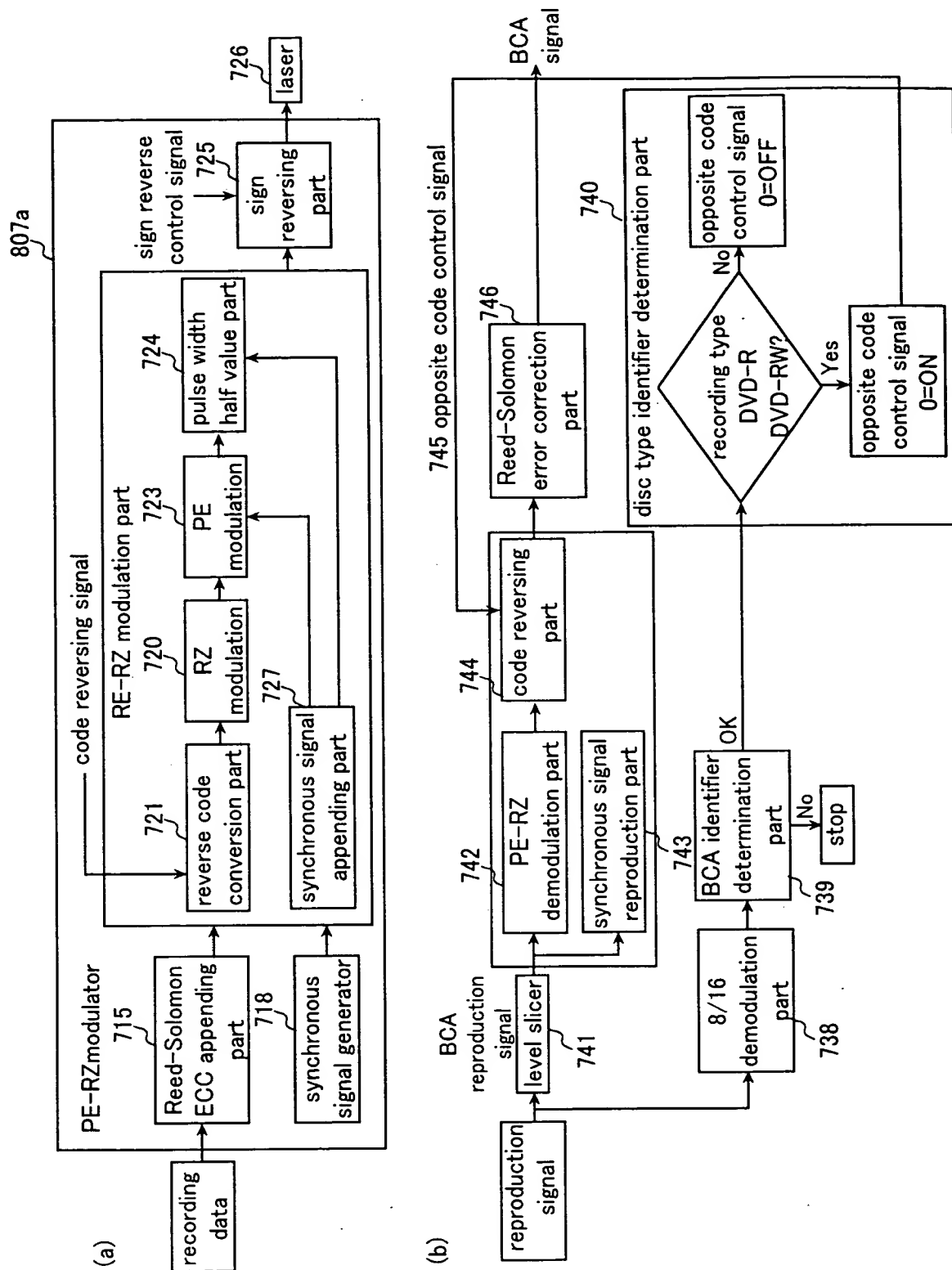


FIG. 15

FIG. 16

(a) data configuration (n=12, 188 bytes)

(b) data configuration (n=1, 12 bytes)

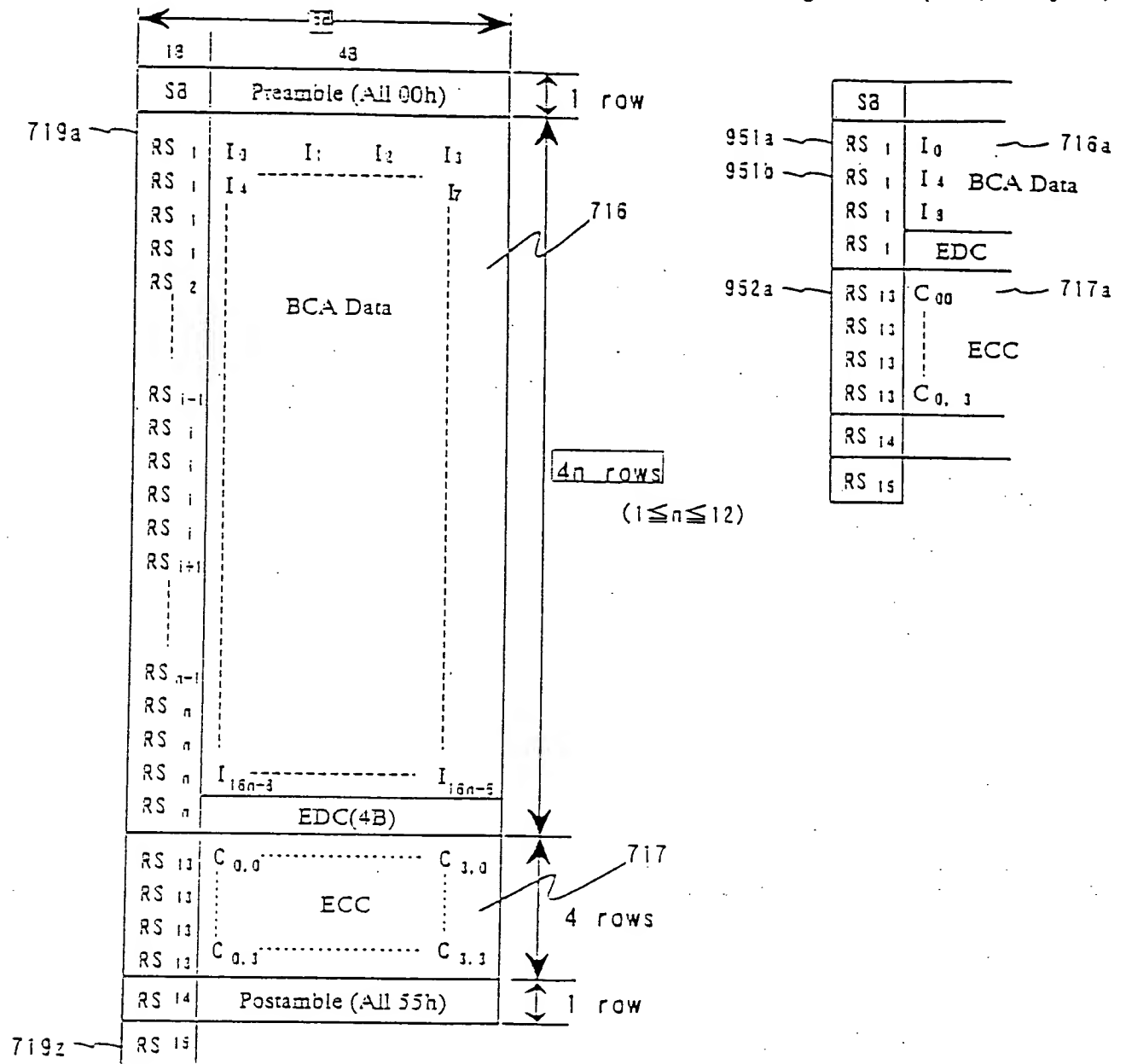
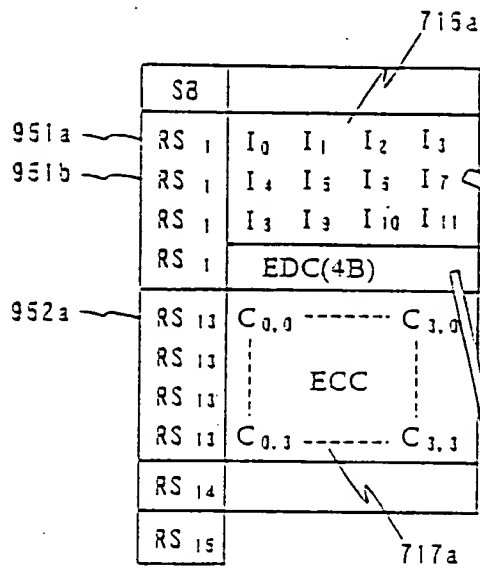




FIG. 17

(a) data configuration (n=1, 12 bytes)



(b) virtual data configuration for ECC calculation (n=1, 12 bytes)

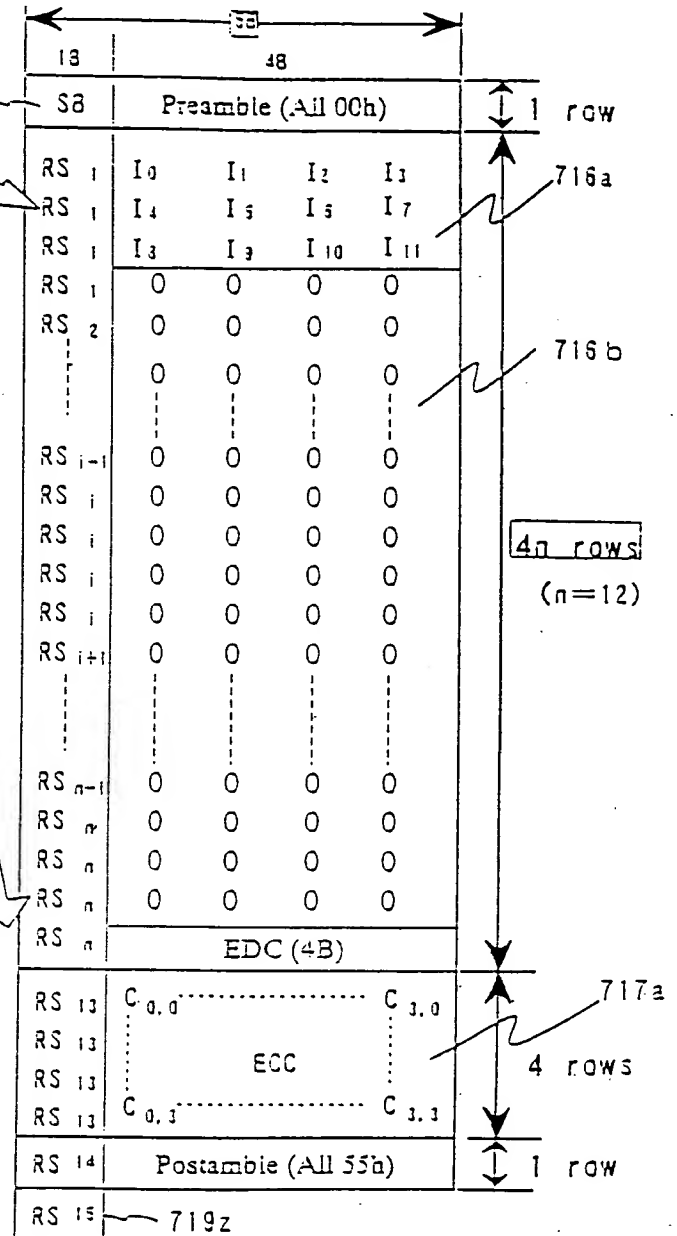


FIG. 18

(a) data of synchronous code      synchronous code

Sync Byte /Resync	Bit Pattern											
	Fixed Pattern								Sync Code			
	( Channel bit )								( Data bit )			
	C <sub>15</sub>	C <sub>14</sub>	C <sub>13</sub>	C <sub>12</sub>	C <sub>11</sub>	C <sub>10</sub>	C <sub>9</sub>	C <sub>8</sub>	b <sub>3</sub>	b <sub>2</sub>	b <sub>1</sub>	b <sub>0</sub>
791a S8	0	1	0	0	0	1	1	0	0	0	0	0
791b RS 1	0	1	0	0	0	1	1	0	0	0	0	1
RS 2	0	1	0	0	0	1	1	0	0	0	1	0
⋮												
RS i	0	1	0	0	0	1	1	0				
⋮												
791z RS <sub>15</sub>	0	1	0	0	0	1	1	0	1	1	1	1

(b) fixed synchronous pattern

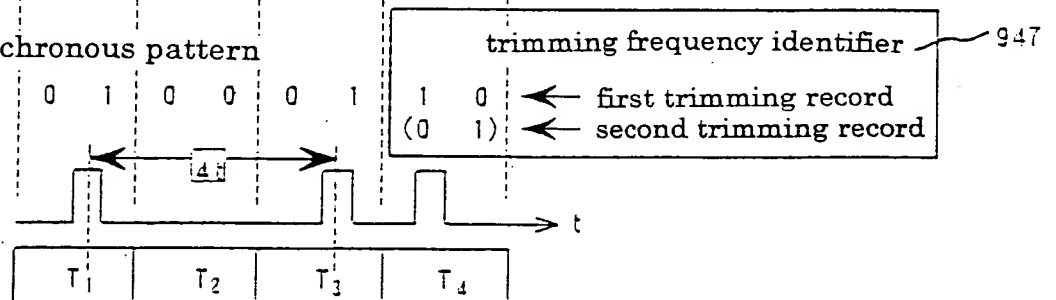
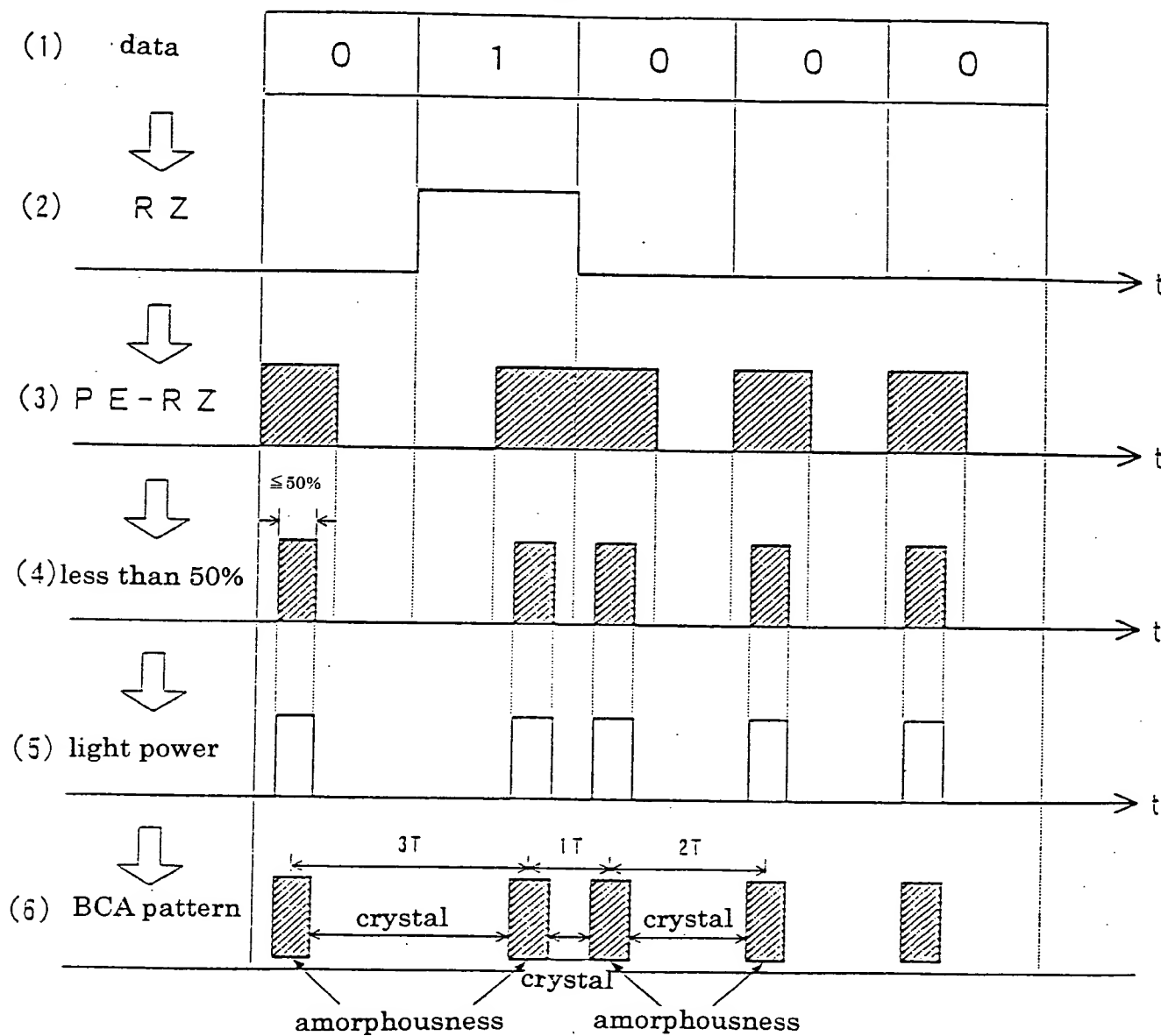


FIG. 19

modulation signal of ROM disc



modulation signal of RAM disc

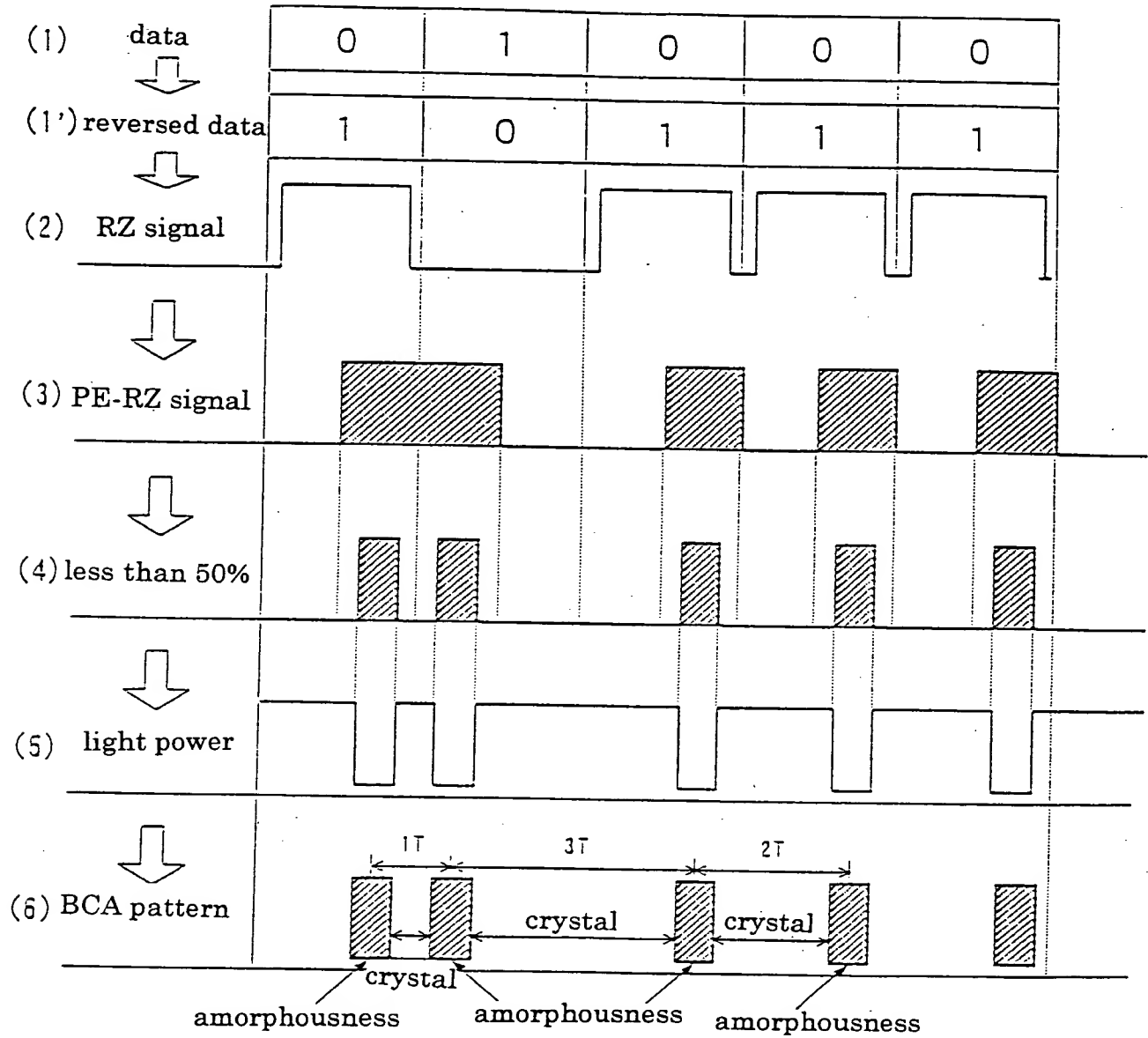
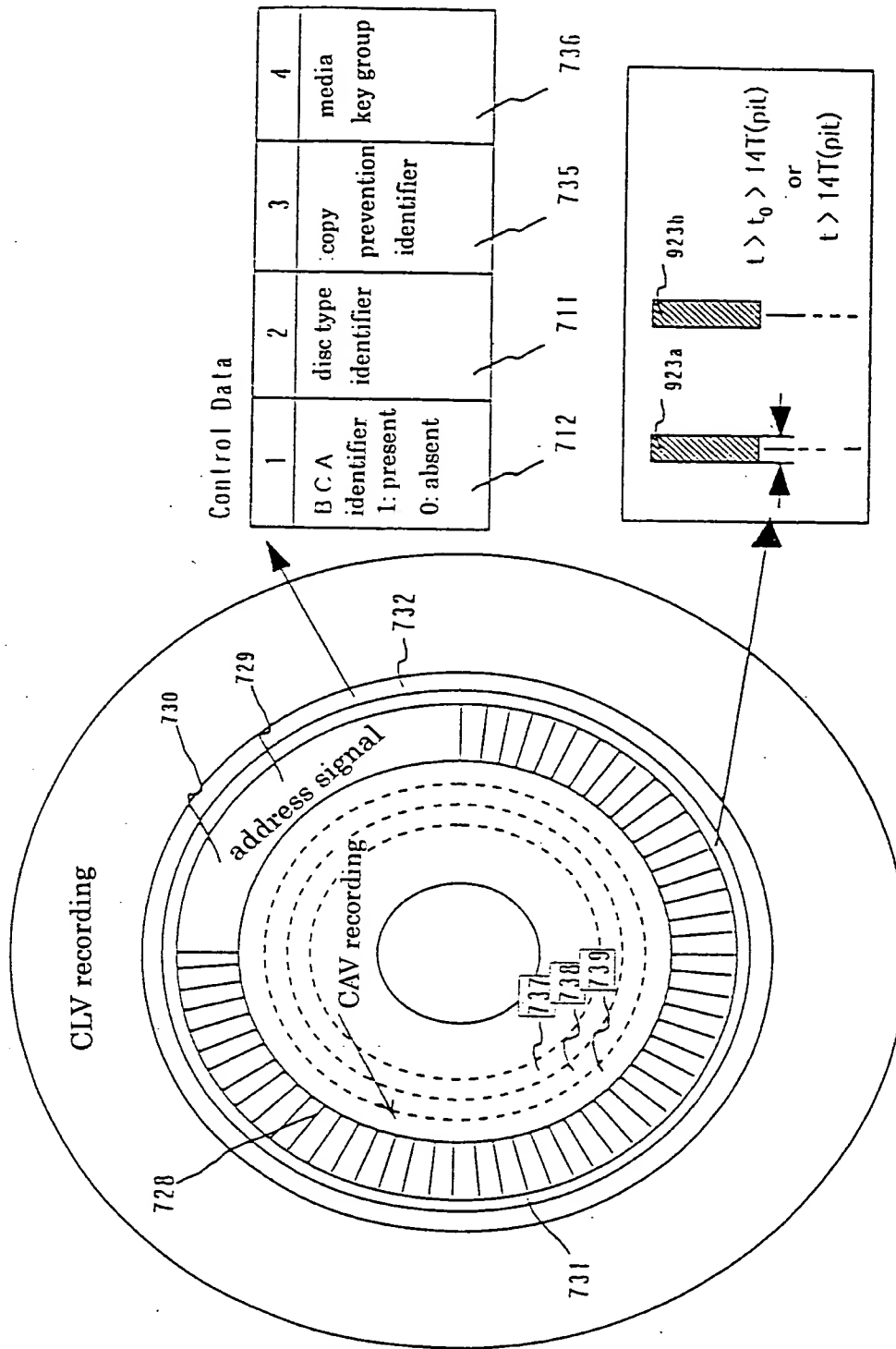
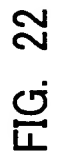


FIG. 21





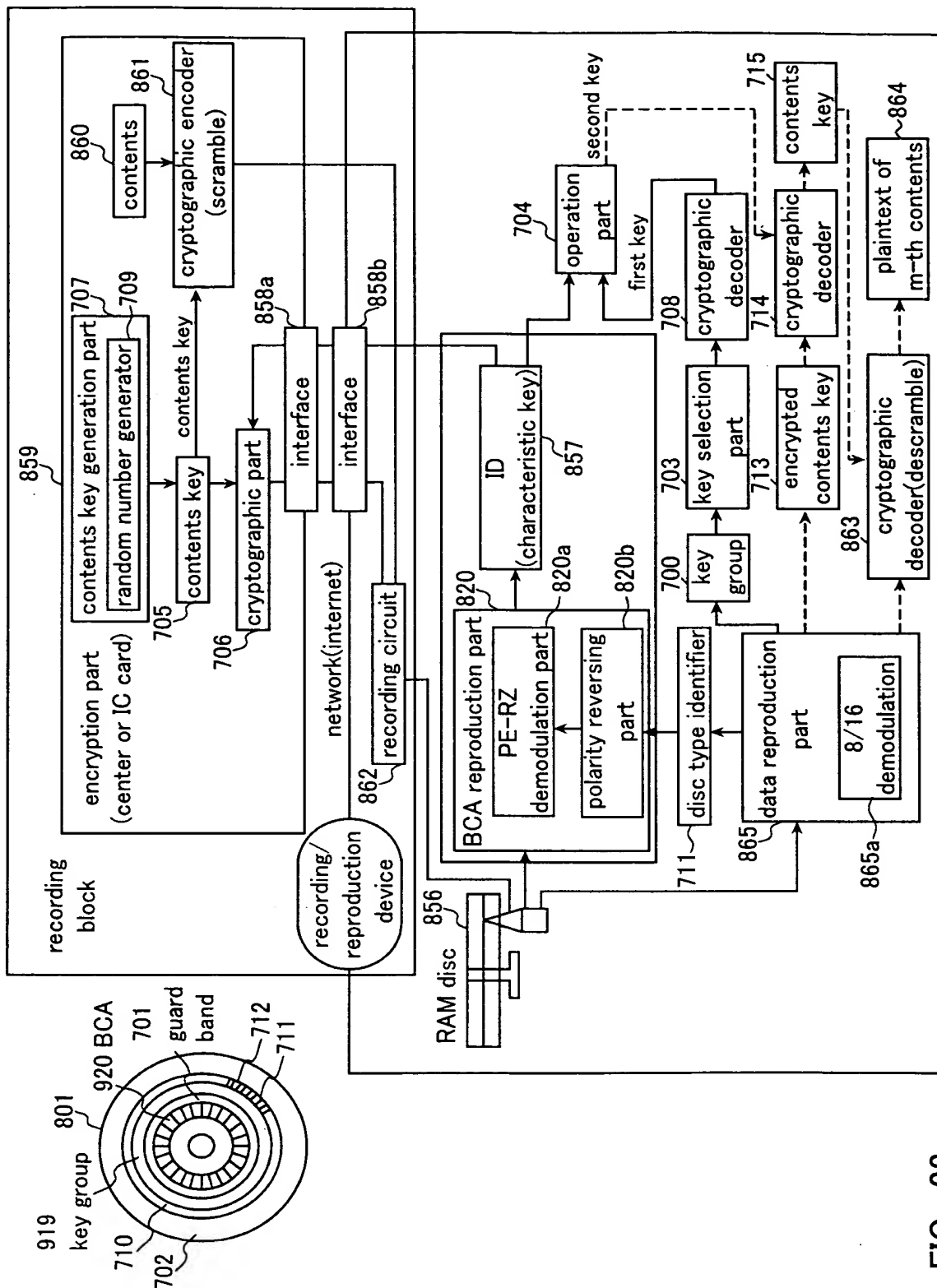


FIG. 23

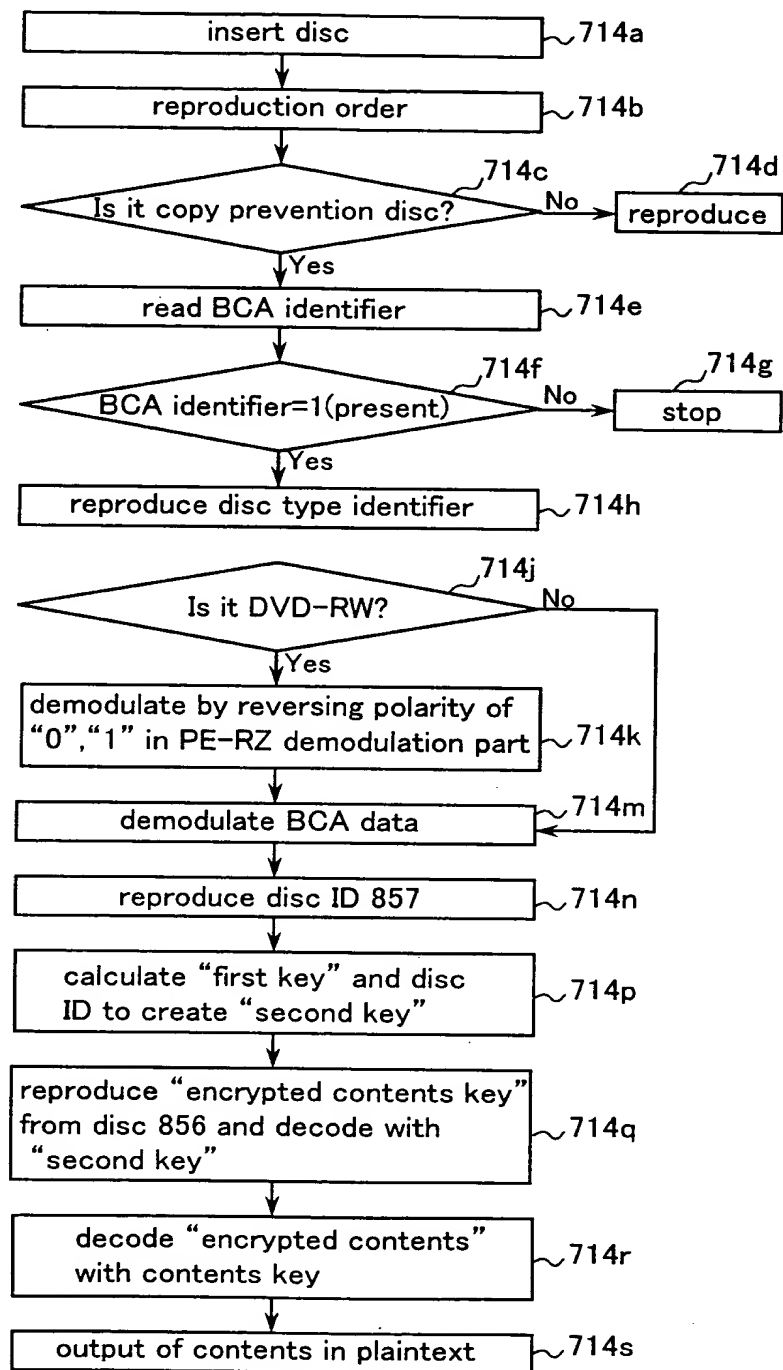


FIG. 24